MOSFETs
Metal Oxide Semiconductor Field Effect Transistors

Gate is epitaxially grown polycrystalline Silicon
Drain & Source are diffusion regions
Thinox is epitaxially grown SiO₂
Ion implanted channel (depletion mode only)

Two channel types
n-channel (Drain & Source are n-type diffusion)
p-channel (Drain & Source are p-type diffusion)

Two channel modes
Depletion Mode (channel exists with no voltage)
Enhancement Mode (voltage creates channel)
Basic Operation

Threshold voltage ($V_t$) - Gate voltage ($V_{GS}$) at which the MOSFET begins to conduct (turn-on)

Assuming fixed, positive $V_{DS}$:

NMOS technology uses n-channel depletion and enhancement mode transistors

CMOS technology uses both n-channel and p-channel enhancement mode transistors

We will mainly consider CMOS (some NMOS)

Good and poor logic values